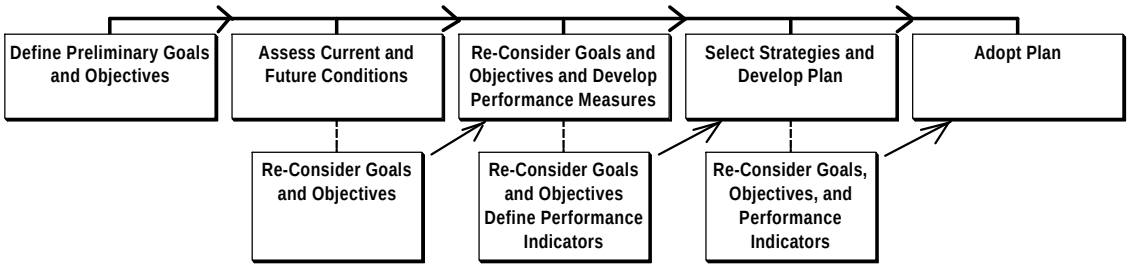
A GOAL-BASED COMPREHENSIVE WATER RESOURCES PLAN FOR THE DELAWARE RIVER BASIN

INTRODUCTION:

On May 14-15, 2001 the Delaware River Basin Commission's (DRBC) Watershed Advisory Council held a workshop to discuss substantive and procedural issues relating to the development of a new comprehensive water resources plan for the Delaware River Basin. A major outcome of the workshop was consensus that the planning process should be "goal-based". As a next step in the process it was agreed that DRBC staff and consultants would review the results of previous "visioning" and water-related planning processes (e.g., *Flowing Toward the Future*, the *Management Plan for the Delaware Estuary, etc.)* and prepare a set of draft goals for consideration by the Watershed Council at its next meeting.

At a second workshop on Dec 4-5 2001, this draft set of goals and objectives to guide the Comprehensive Plan development process was developed by the Council, for approval by the Commission. It is believed that a "strategic focus" on desired future water resources conditions and planning outcomes will be provided by establishing overall goals and more specific objectives early in the planning process. However, as depicted below, it is expected that goals and objectives will be revisited and possibly revised at several points in the planning process. Additions or modifications to the goals and objectives, as well as the associated management strategies and performance indicators, will likely be necessary as our understanding of water resources problems and needs comes into better focus.

DELAWARE RIVER BASIN
COMPREHENSIVE PLAN DEVELOPMENT



ORGANIZATION OF THE PLAN AND DEFINITION OF KEY TERMS:

The Council established the structure or format for presentation of information and recommendations and adopted a common set of definitions. This structure, which is derived from results-oriented strategic planning concepts, incorporates **key result areas** (KRAs), **desired results**, **goals**, **objectives**, **management strategies**, and **performance indictors**. The proposed definitions of these terms are:

> **Key Result Areas –** KRAs represent the themes around which the comprehensive plan will be organized. KRAs provide broad categories by which to cluster or group desired outcomes and results to be achieved through implementation of the comprehensive plan. Five KRAs are proposed:

- Manage the Quantity and Quality of the Water Resources of the Delaware River Basin for Sustainable Use
- Waterway Corridor Management
- Land Use and Land Management for Water Resources Protection
- Institutional Coordination and Cooperation for Water Resources Management
- Public Education and Involvement

Desired Results – A statement of desired results is proposed for each KRA. As implied, a desired result provides a general description of the future conditions to be realized through implementation of the plan.

Goals – A set of goals is proposed for each KRA that provides somewhat greater specificity and direction with regard to desired outcomes or results. Generally, goals are developed around topical or programmatic issues and are not measurable or time-specific.

Objectives – Objectives are milestones in the process of achieving a goal. They are clearly defined, usually with a measurable or time-specific outcome, and they call for a specific result that implies a set of actions or strategies. Unless otherwise stated, objectives refer to the entire Delaware River Basin.

All dates are subject to revision. Dates given are intended to be placeholders that guide the advisory committees. Where a "T" precedes a date, the Council considers that date to be appropriate for the associated objective. "T" represents a "Task" that the council has designated as a priority objective.

Management Strategies – One or more strategies will be recommended for each objective. Strategies represent the actions or steps to be taken to attain the objective. Generally, management strategies should include identification of the entity (ies) responsible for implementation of the strategy, identification of funding requirements and sources, and identification of the timetable for implementation.

Performance Indicators – Often referred to as "metrics", performance indicators show the progress toward attaining an objective. Performance indicators can be either outcome oriented (e.g., number of stream segments in compliance with water quality standards) or provide a measure of efficiency (e.g., cost per million gallons of municipal water supply). Where possible, both outcome and efficiency measures should be defined for each objective.

KEY RESULT AREA: **MANAGE THE QUANTITY AND QUALITY OF THE WATER RESOURCES OF THE DELAWARE RIVERBASIN FOR SUSTAINABLE USE**

DESIRED RESULT: Integrated management of the surface and ground water resources of the Delaware River Basin to ensure an adequate, reliable and sustainable supply of water for human and ecological uses for the 21st century and beyond.

GOAL NO. 1: Develop an integrated resource management strategy that includes regulatory and non-regulatory approaches and equitably balances the multiple demands on the limited water resources of the Delaware River Basin, while preserving and where possible restoring biologic and hydrologic integrity of watersheds.

OBJECTIVES:

T A. By 2004, establish water budgets for all Delaware River Basin watersheds at the appropriate geographic scale (e.g., 80 to 100 square miles or smaller if needed/desired).

T B. By 2004, develop the tools to evaluate multiple scenarios for determining water allocations among various uses.

C. Future and expanded inter-watershed transfers of water shall incorporate a demonstration of need (e.g., economic, environmental), use corresponding best management practices to ensure environmental benefit to sending and receiving watersheds, and establish performance standards to protect the water resources of the sending watershed.

D. Any future interbasin transfers of water may be approved only if there are no feasible alternatives and with consideration of the needs of both the receiving and providing basins.

GOAL NO. 2: Ensure an adequate supply of suitable quality water to restore, protect and enhance aquatic ecosystems throughout the Delaware River Basin. [*Note: There is an apparent inconsistency of language with Goal No.1 that will be addressed by the Council*.]

OBJECTIVES:

T A. Continue, and by 2004 have determined the instream flow and estuary freshwater inflow requirements to the extent feasible (quality, quantity and timing, duration, frequency and rate-of-change of flows) to support healthy aquatic ecosystems.

B. Continue implementation of strategies to achieve flow targets for meeting the instream flow and freshwater inflow requirements of aquatic ecosystems and complete implementation by 2010. (Note: there may be some circumstances in which implementation cannot be achieved by 2010.) (Note: number of parties thought this should be a task.)

C. Meet the water quality standards for the protection of fish and wildlife resources in all waters of the Delaware River Basin. {Note: management strategies will define dates for when individual standards will be achieved}

D. By (dates in accordance with state schedules for TMDL development), prepare all necessary TMDLs required by states. (See attached table)

E. Coordinate or lead management strategies for achieving appropriate water quality standards for impaired water bodies in accordance with the schedule established for each TMDL.

F. Maintain water quality in all non-impaired water bodies.

G. Council has been advised that DELEP is addressing anadromous fish runs and wants to be advised of their decision. The results of the DELEP process should also go to advisory committee to develop recommendations of how to address anadromous fish.

H. By the year 2010, increase native freshwater mussel populations.

GOAL NO. 3: Ensure an adequate and reliable supply of suitable quality water to satisfy domestic, municipal, industrial, and agricultural water needs using supply and demand management techniques.

OBJECTIVES:

A. Ensure that adequate supplies of water are available for projected domestic, municipal, industrial, and agricultural irrigation water demands under normal hydrologic conditions through 2030, while protecting aquatic ecosystems.

B. For future droughts ensure the equitable apportionment of water supplies for essential domestic, municipal, industrial, agricultural and aquatic ecosystems and strengthen coordination among the four states and DRBC. *(Note: Significant number of parties are concerned that aquatic ecosystems is in the mix and not given protection above other uses.)*

C. Continuously protect the quality of public and industrial water supplies by preventing the isochlor from exceeding 180 ppm at river mile 98.

D. Implement best practices to reduce per capita municipal water demand, giving priority to systems that do not take and return water to the same source (i.e., watershed transfers).

E. By 2020, increase the beneficial reuse and recycling of reclaimed (gray) water by (250) million gallons per day.

F. Meet water quality standards to protect drinking water sources throughout the Delaware River Basin.

- By dates in accordance with state schedules for TMDL development, prepare all necessary TMDLs required by states.
- Coordinate or lead management strategies for achieving appropriate water quality standards for impaired water bodies in accordance with the schedule established for each TMDL.
- Maintain water quality in all non-impaired water bodies.

GOAL NO. 4: Ensure adequate and suitable quality stream flows for flow-dependent recreational activities (e.g., swimming, canoeing, rafting, fishing and kayaking).

OBJECTIVES:

T A. By 2004, determine the stream flow requirements for water-based recreation in the Delaware River and tributaries .

B. By 2004, establish flow targets and evaluate alternative flow management/augmentation policies for meeting stream flow requirements for water-based recreation in the Delaware River and tributaries.

C. In 2006 initiate implementation of strategies to achieve flow targets for meeting the instream flow and freshwater inflow requirements for water-based recreation in the Delaware River and its tributaries and complete implementation by 2020.

D. Meet water quality standards for primary contact recreation and evaluate all other stream segments for their suitability for primary contact recreation throughout the Delaware River Basin.

- By (dates in accordance with state schedules for TMDL development), prepare all necessary TMDLs required by states. (See attached table)
- Coordinate or lead management strategies for achieving appropriate water quality standards for impaired water bodies in accordance with the schedule established for each TMDL.
- Maintain water quality in all non-impaired water bodies.

KEY RESULT AREA: WATERWAY CORRIDOR MANAGEMENT

DESIRED RESULT: Integrated management of waterway corridors throughout the Delaware River Basin to reduce and minimize flood losses, improve recreational access, and to protect, conserve and restore riparian aquatic ecosystems.

GOAL NO. 1: Prevent, minimize, and reduce loss of life and damage to property and to riparian and instream ecosystems from flooding and where feasible, return floodplains to their natural function.

OBJECTIVES:

A. By 2006, accomplish the upgrade and modernization of flood warning and forecasting capabilities for the Delaware River Basin.

B. By 2004 develop strategies, and by 2005 initiate implementation of strategies (e.g., low impact development) to increase infiltration and decrease storm water discharges and rates of discharges from residential, commercial, and industrial development and transportation systems.

C. By 2005, utilize existing flood information to characterize flood damage risk including risks from ice jam in the Delaware River Basin and recommend appropriate non-structural and/or structural measures to minimize, reduce, and/or mitigate flood losses and to reduce loss of life due to flooding.

D. By 2010, reduce flood damage expected from the 100-year flooding within the Delaware River Basin by 10%, referenced to year 2000 damages and dollars.

E. By 2010, return (X) acres in basin to naturally functioning floodplain and/or remove (X) miles of levees or berms, where feasible and maintaining level of safety.

GOAL NO. 2: Increase sustainable recreational use of the Delaware River and its tributaries by improving public access and by promoting the basin as a tourist destination.

OBJECTIVES:

A. By 2005, develop a recreational water use and public access plan that assesses the needs of the recreational users and identifies opportunities within the context of the recreational sustainable use.

B. By 2010, complete 25% of the new facilities identified in the Plan for public access to the Delaware River and its tributaries.

C. By 2010, add 25% of the new facilities for public access to the tidal portions of the Delaware River and its tributaries in accordance with the recreational water use and public access plan.

D. By 2006, create a continuous network of water trails for the Delaware River and its tributaries with supporting signage, maps and educational materials in accordance with the recreation water use and public access plan.

E. Continue on-going and expand by 10 % per year, programs to ensure river/stream trash and debris clean up and removal.

F. By 2005, develop and implement a cooperative public-private interstate campaign to promote the Delaware River Basin as a recreation/tourism destination.

GOAL NO. 3: Protect, conserve and/or restore healthy and biologically diverse riparian and instream aquatic ecosystems throughout the Delaware River Basin.

OBJECTIVES:

A. By 2015, restore population levels of depleted harvestable species of finfish and shellfish species to levels that will support sustainable recreational and commercial fisheries.

B. By 2030, achieve a net increase in wetland acreage and quality in the Delaware River Basin.

T C. By 2006, complete the identification and mapping of critical riparian and aquatic habitat throughout the Delaware River Basin, by 2008 begin implementation of strategies to protect, conserve, restore, and enhance such habitats (e.g., provide for passage of anadromous fish) and complete implementation by 2030.

D. By 2006, develop and by 2008 implement a basin-wide program for the management of harmful invasive non-native plant and animal species in riparian and aquatic ecosystems.

E. Using tested methods to promote riparian habitat, beginning in 2005 restore 20 miles per year of unstable stream channels in the Delaware River Basin.

F. By 2010, realize a five-fold increase in oyster harvests from the Delaware Estuary. (Note: In NJ this is the current plan. Some parties are skeptical that this objective can be achieved.)

G. By 2008, develop plan for the beneficial use of dredged material to achieve ecological habitat enhancement and restoration.

H. By 2006, open up 100 miles of streams by removing dams and/or installing fish passages to promote and enhance anadromous and catadromous fish passage**.**

I. By 2004, begin to implement strategies throughout the Delaware River Basin to enhance and sustain stream base flows.

GOAL NO. 4: Assure that recreational impacts do not degrade the water quality.

OBJECTIVES:

T A. By 2004 identify and quantify impacts of recreational uses of the river, its tributaries and streambanks to water quality.

B. By 2006, reduce water quality impacts from recreational uses by 25% with continued efforts made to achieve an overall 95% “no impact” target.

KEY RESULT AREA: LAND USE AND LAND MANAGEMENT FOR WATER RESOURCES PROTECTION

DESIRED RESULT: The management of land uses and resources of the Delaware River Basin in a sustainable manner to restore, preserve and enhance water and related natural ecological resources while recognizing the social and economic needs of communities inside and outside the Basin that rely on the water resources of the Delaware River Basin.

GOAL NO. 1: Fully integrate water resources-related considerations into land use planning and management at the state, regional, county, and local levels.

OBJECTIVES:

A. By 2004, develop a program for the identification and prioritization of appropriate scale watersheds for the development of model Integrated Watershed Management Plans by State or by State eco-regions.

B. By 2004, initiate the development and implementation of integrated watershed management plans that embody "smart growth" principles in the prioritized watersheds of the Delaware River Basin. The watersheds selected for plan development will be done based on those with the highest priority for water resource protection as defined by the individual states.

C. By 2007, in all watersheds with watershed management plans, municipalities will adopt ordinances that protect local water resources, as recommended by the planning process.

D. By 2007, in all watersheds with a watershed management plan, develop and implement the use of non-regulatory, incentives-based alternatives of preserving water resources at the local level.

T E. By 2005, collect and develop analytical tools (e.g., landscape ecology) and models that evaluate the water resources impacts of municipal land use plans and disseminate information to expand and encourage the use of these tools and models.

GOAL NO. 2: Encourage development and re-development in areas with available infrastructure that will improve the economic viability of local communities while restoring, preserving and enhancing the water resources of the Basin.

OBJECTIVES:

A. 75% of all new development basin-wide will be located within areas designated for concentrated growth and will occur in a manner that provides for the protection of water and there natural resources.

T B. By 2004, identify areas that would benefit economically and environmentally from re-Development

T C. By 2004, identify funding sources that are potentially available for development and redevelopment projects.

T D. By (2005), encourage the implementation of re-development projects on prioritized sites.

T E. By 2005, develop criteria and incentives to be applied during state and DRBC project review and suggested review by local, regional, and state entities that provide for a differential review based on best practices, project locations, and potential water resource impacts consistent with local growth management decisions.

GOAL NO. 3: Protect and restore environmentally sensitive lands and preserve open space to restore, preserve and enhance water resources in the Delaware River Basin.

OBJECTIVES:

A. By 2005, initiate strategies to establish riparian corridors, in priority watersheds, in order to Protect streams from land uses that negatively impacts water resources.

B. By 2004, discourage incompatible development within the 100-year flood plains of the Delaware River Basin.

C. From 2004 on, protect wetlands in the Basin from degradation associated with land development.

D. From 2004 on, protect forested land in the Basin from degradation associated with land development.

E. By 2005, delineate and protect important ground water recharge areas in the Basin from degradation (both quantity and quality) associated with land development.

F. By 2004 develop strategies to protect headwater streams from adverse impacts.

G. Continue to preserve open space for water resource protection within the Basin.

GOAL NO 4: Preserve the agricultural use of land and the agricultural community in a sustainable manner to restore, preserve and enhance the water resources of the Delaware River Basin

OBJECTIVES:

A. Preserve farmland through regulatory and non-regulatory means within the Basin that has instituted water resource protection practices.

B. Continue widespread implementation and achieve full implementation by 2020 or sooner as appropriate of appropriate agricultural Best Management Practices for water resource protection.

KEY RESULT AREA: INSTITUTIONAL COORDINATION AND COOPERATION FOR WATER RESOURCES MANAGEMENT

DESIRED RESULT: Create, strengthen and institutionalize partnerships for the management of the water resources of the Delaware River Basin among all levels of government, the private sector, non-governmental organizations, and individuals that have an interest in sustainable water resources management.

GOAL NO. 1: Improve coordination and cooperation in basin-wide management of the Delaware River Basin.

OBJECTIVES:

A. By 2006, achieve consistency in water quality standards that affect the interstate water resources of the Delaware River Basin.

B. By 2006, achieve comparable monitoring, documentation and accurate reporting of data that involves the basin-wide water resources of the Delaware River Basin.

C. By 2006, achieve consistency in standards used for making public health and recreation advisories in regard to the interstate water resources of the Delaware River Basin.

D. Continue to foster communication among state and local watershed programs and processes.

E. Encourage watershed to watershed communication.

GOAL NO. 2: Increase sharing of data, information and ideas among Delaware River Basin stakeholders to foster partnerships and reduce duplication of effort. (Note: Develop an index of available data as a benchmark.)

OBJECTIVES:

T A. By 2004, complete 7 digital data layers for the entire basin plus several other selected GIS layers accessible via the internet.

B. By 2006, make digital data layers and water-related databases accessible via the Internet.

T C. By 2006 develop a database of ongoing management activities to foster partnerships and reduce duplication of efforts.

GOAL NO. 3: Provide adequate funding for programs and projects that encourage cooperative water resources planning and management.

OBJECTIVES*:

A. For each year, secure funding for (project, program, activity, etc.).

*These objectives will become better defined later in the process.

KEY RESULT AREA: PUBLIC EDUCATION AND INVOLVEMENT

DESIRED RESULT: All citizens of the Delaware River Basin will have a collective understanding and appreciation of the water resources of the Basin and a shared commitment to the restoration, enhancement, and protection of those resources. The Basin's citizens will value the Basin's water resources and understand their personal responsibilities needed to protect the resource.

GOAL NO. 1: Increase students' awareness of, understanding of and active participation in water resources issues through the widespread introduction of special curricula and other educational activities in schools throughout the Delaware River Basin.

OBJECTIVES:

A. By 2008, develop and implement a strategy to incorporate Delaware River watershed curricula in the education standards of the four Basin states (i.e., Delaware, New Jersey, New York, and Pennsylvania).

B. Continue to promote and expand school programs that provide active participation in watershed protection, restoration, monitoring and awareness building.

GOAL NO. 2: Increase citizen awareness of, understanding of and active participation in water resources issues.

OBJECTIVES:

A. Continue and expand the use of Internet and mass media resources to educate the public about water resources issues

B. By 2010, increase participation in volunteer water resource projects and programs in the Basin by 25%.

C. By 2010, increase the number of projects, programs and opportunities for citizen participation in water resources management protection and enhancement by 25%.

D. By 2004, implement a watershed signage program, for the mainstem Delaware River and all of its major tributaries, on all state and interstate highways in the Basin.

GOAL NO. 3: Increase private sector awareness of, understanding of and active participation in water resources issues.

OBJECTIVES:

A. By 2007, implement programs that inform members of the commercial community about water resources issues.

B. By2007, implement demonstration projects that provide technology and information transfer to commercial interests in the Delaware River Basin.

GOAL NO. 4: Increase local public officials' awareness of, understanding of, and active participation in water resources issues, needs and management strategies.

OBJECTIVE:

A. By 2005, implement outreach and technical assistance programs targeted at local public officials.

GOAL NO. 5: Increase opportunities for the sharing of ideas, data, technology, and information among public/ private professionals involved in water resources issues.

OBJECTIVE:

A. Convene appropriate gatherings of Delaware River Basin water resource professionals to share ideas and information beginning in 2005.

Glossary of Terms

These definitions should be discussed and revised as needed to accurately reflect their intended meanings in this document.

Adequate Supply

Aquatic Ecosystem - The living and non-living natural components of a stream.

Feasible Alternatives

Headwater Streams - All first order streams that are delineated as a blue line on a 1:24,000 7.5 minute United States Geologic Survey quad map; up to and including their point of origin, such as seeps and springs along with their adjoining riparian corridors (Headwater Subcommittee, Clean Water Council, NJDEP Division of Watershed Management)

Infrastructure

Invasive Species - Any species that may aggressively and negatively alter the functioning of an existing ecosystem. Invasive species are usually non-native.
OR
Any plant, animal, or other viable biological material that enters an ecosystem beyond its historic range. (adapted from "Region 4 Nonindigenous Species Issues", by Roland Ferry USEPA Region 4, 1999)

Municipal

Municipal Demand

Reliable Supply

Riparian Ecosystem - The riverside or riverine environment next to the stream channel

Smart Growth

Sustainable - Referring to the use of a resource in a manner that meets current needs without compromising the ability to adequately meet future needs.

Unstable Stream Banks - Stream banks that are unable to maintain natural hydrologic and hydraulic function due to one or more outside influences, including confinement, increased flow, excessive inputs of sediment and removal of vegetation. This instability may also affect biological function in a stream.
OR
A symptom of stream channel instability associated with streambed aggradation or lateral channel migration. Causes include loss of vegetative root mass; localized upstream changes in sinuosity, slope, resistance of bed materials, flow velocity or discharge; floodplain development; stream channel confinement; and loss of riparian buffers.

Water Budget – For the purposes of this Plan, a water budget is an accounting of all the water in a watershed. It describes and quantifies the pathways water takes as it moves through the hydrologic system, including precipitation, infiltration, run-off, evapotranspiration, consumptive use, recharge, etc.

Water Resources

Water Trail - A continuous stretch of waterway for canoeing, including such amenities as special access points and informative signage.

Watershed

Watershed Management Plan - A strategic plan for a watershed that identifies a set of important water quality, quantity and land use issues and describes and prescribes methods of addressing those issues at a watershed scale.

Waterway Corridor - A stream and the portion of its adjacent landscape that directly affects and is affected by its hydrology and ecology.

Wetland Quality - The level at which a wetland performs the natural functions that are ascribed to wetlands, including flood storage, filtration of potential pollutants and provision of habitat. Wetlands that perform these functions at a high level, and/or provide habitat for rare or endangered species may be considered “high quality” wetlands.